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Getting technical

With a degree in natural sciences and diploma in translation, I have often worked part-time as a translator in the field of information and communications technology (ICT). I studied natural sciences at university, and have had a career of almost four decades in higher education – teaching and researching technological subjects. I have always been fascinated by languages, though, and soon after leaving university I studied part-time for the Institute of Linguists exams, obtaining the Final Diploma in French and German, and the Translators' Final Diploma in German. Over the years I have carried out professional translating in information and communications technology, and added a number of other languages to my 'toolbox'. I've also used my knowledge of languages in my research, and acquired a basic knowledge of Russian for this purpose.

In this article I give some personal reflections on translating in the ICT field. Little of it will be novel to technical translators, but I hope it will give others some insight into the pleasures – and potential pitfalls – of this particular linguistic activity.

ICT vocabulary and unmasking 'false friends'

Apart from highly technical terms – and some of these are quite often used in the original English in source texts – ICT vocabulary does not present huge difficulties. For novices, some very simple concepts do require care, however. The normal French / German terms for 'voltage', for example – *tension* / *Spannung* – both have numerous other meanings, some technical and some not (tension, pressure, strain, stress, nervousness, excitement, …) as does the German *Kraft* (power, force, energy, strength). A mistranslation of such terms in a technical text could be potentially very damaging. Another word requiring some care from novices is 'battery' often *pile* / *Akku* in French / German (although strictly speaking an 'accumulator' is a rechargeable device). And a 'fuel cell' (which converts a gas such as hydrogen directly into electricity, and now beginning to be used in mobile telephones and computing devices) is never a 'battery in English, but a ***pile*** *à combustible* in French.

So, as always, you have to be cautious. On a more technical level, for example, the French for 'signal processing' is either *traitement de signal* (the more common term) or *élaboration de signal* (sometimes you will also see *du signal* or *des signaux).* But while the *traitement* versions in GoogleTranslate are given correctly at the time of writing, the *élaboration* alternatives return literally as 'elaboration'. One way of checking such matters in the source is to try a search in the appropriate language version of Google: in this case *traitement de signal* gives 1.5 million hits in google.fr, while *élaboration* comes up with a few hundred thousand. Another on-line mistranslation is 'research' , 'computing' or 'integrator' for the computer term *Rechenwerk*, which in German *"wird häufig synonym mit arithmetisch-logische Einheit (ALU)"* [Wikipedia.de and see also the diagram below].

Use of multiple sources to obtain information or to check proposed draft translations is often known as 'triangulation', by analogy with the surveying technique of using at least three measurements to pinpoint a location, and is thus a vital skill.

A final interesting false friend example comes from a translation of a Russian text I was checking a little while ago. The Russian word *полутон* [poluton] was translated as 'semitone' – an understandable mistake, perhaps, except that the context was image, rather than audio, processing! Now, if you happen to know the printing (or *Photoshop*™!) terms 'half tone' or 'half tint' you will realise that the author is discussing gradations of an image colour density. A good Russian dictionary will give both terms, but an on-line

version defining the terms in the source language is particularly useful – for example, readers with a knowledge of Russian will easily clarify the issue with something to be found on the Web such as:

> *ПОЛУТО́Н*
> *1. Наименьший интервал темперированной гаммы (муз.).*
> *2. Цвет, краска, образующая переход от светлого тона к темн.*

Other uses of the Web

Wikipedia is, of course, another highly useful resource, as it will give reasonably authoritative entries on technical topics in a whole range of languages. For example, here are the beginnings of entries on digital modulation in English, French and German, which further the translator's technical understanding and give useful examples of terminology.

Fundamental digital modulation methods

The most fundamental digital modulation techniques are based on keying: PSK (phase-shift keying), a finite number of phases are used; FSK (frequency-shift keying), a finite number of frequencies are used; ASK (amplitude-shift keying), a finite number of amplitudes are used; QAM (quadrature amplitude modulation), a finite number of at least two phases and at least two amplitudes are used.

In QAM, an in-phase signal (or I, with one example being a cosine waveform) and a quadrature phase signal (or Q, with an example being a sine wave) are amplitude modulated with a finite number of amplitudes, and then summed. It can be seen as a two-channel system, each channel using ASK. The resulting signal is equivalent to a combination of PSK and ASK.

Digitale Modulationsverfahren

Zu den einfachsten digitalen Modulationen zählt die digitale Amplitudenmodulation oder auch Amplitude Shift Keying (ASK) genannt, bei der die Amplitude des Sendesignals in diskreten Schritten in Abhängigkeit von der Nutzdatenfolge umgeschaltet wird. Bei nur zwei Sendesymbolen wird zwischen zwei unterschiedlichen Amplitudenwerten gewählt, wovon auch eine Null sein kann. Es können aber auch mehrere Amplitudenwerte (Stufen) gewählt werden.

Die digitalen Winkelmodulationen umfassen ein großes Feld und sind in der einfachsten Form auch als Frequency Shift Keying (FSK) und Phase Shift Keying (PSK) bekannt. Dabei wird die Frequenz oder der Phasenwinkel des Trägersignals in diskreten Stufen umgeschaltet.

Im digitalen Bereich werden vor allem auch Kombinationen aus Amplituden- und Winkelmodulationen verwendet. Die Information (Nutzdatenfolge) wird dabei sowohl in der Amplitude als auch Phasenlage des Trägers untergebracht. Ein gebräuchliches Modulationsverfahren ist die Quadraturamplitudenmodulation, abgekürzt QAM.

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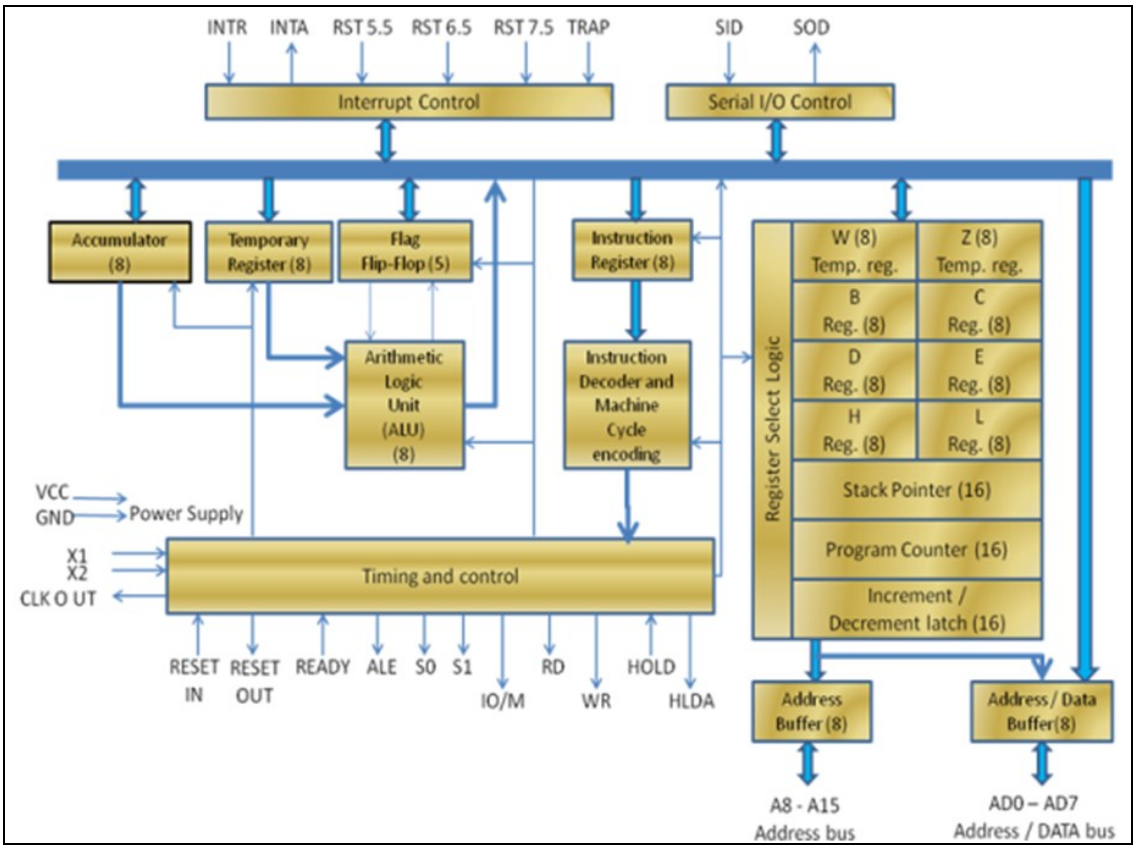
Modulations numériques

En modulation numérique, les paramètres de la porteuse, amplitude ou angle (argument), sont commutés entre plusieurs valeurs discrètes selon les codes binaires à transmettre.

La modulation en tout-ou-rien (*OOK (en): On Off Keying*) avec des durées variables est celle qui est utilisée en télégraphie (code Morse). En modulation par commutation d'amplitude (*ASK* ou Amplitude-shift keying), l'amplitude est commutée entre plusieurs valeurs discrètes. En *FSK* (ou Frequency-shift keying) et en *PSK* (ou Phase-shift keying) ce sont respectivement la fréquence et la phase qui sont commutées. En *APK* (ou QAM), la phase et l'amplitude prennent différentes valeurs discrètes.

Technical diagrams

Something the Internet provides that was not easily available before the advent of the WWW are technical diagrams in various language versions. Here are English, French and German figures of basic microprocessor architecture. Although not completely identical or equivalent, they enable the comparison of vocabulary as well as giving technical information. From the following, for, example, it is easy to identify French and German terms for: arithmetic & logic unit; buffer; various 'buses' (communication links); instruction register; counter; and so on.



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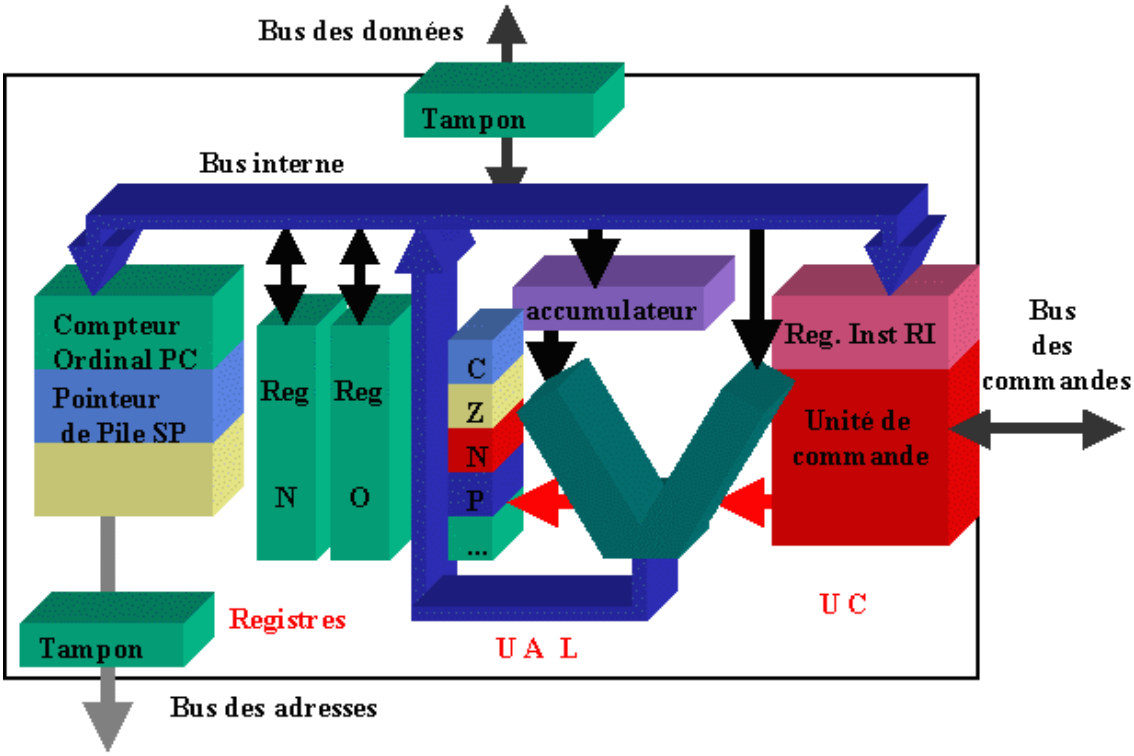

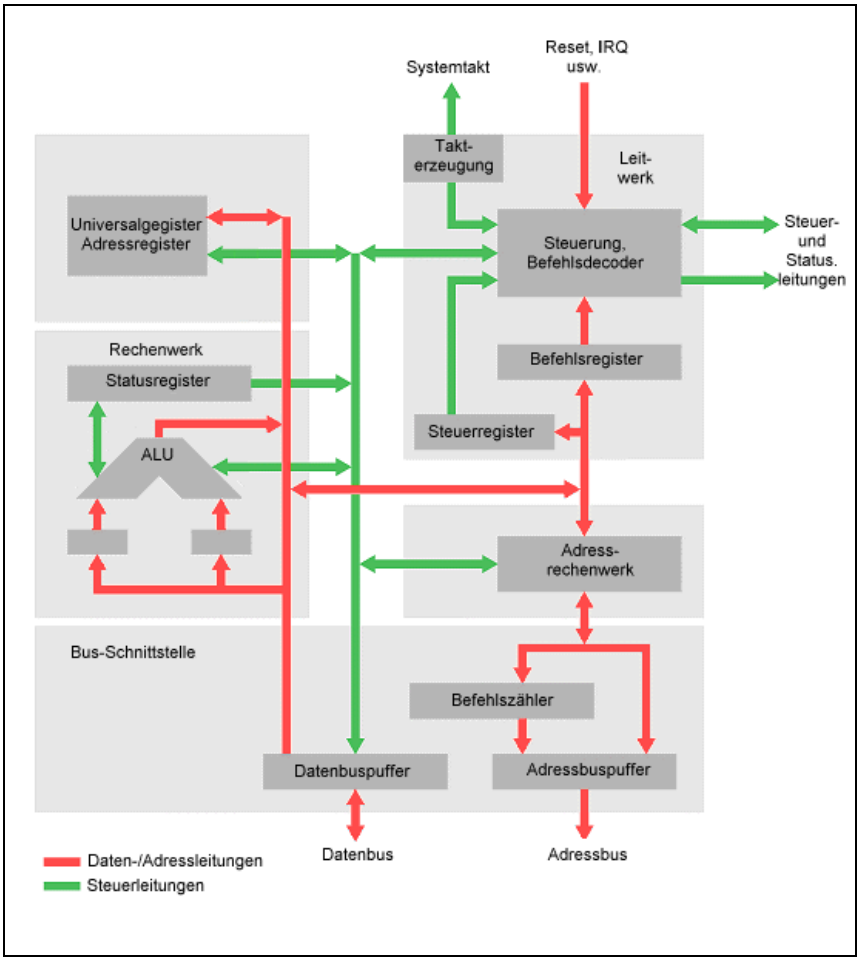

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Conclusion

Much of this short piece can be applied, *mutatis mutandis*, to other fields of specialist translation. I have given some particular points to watch out for that relate specifically to ICT texts, but the hints on using the Internet, for example, and the need to triangulate to avoid error, are widely applicable elsewhere. Perhaps the most important matters for technical translation are still: (i) always remain aware of the many-to-one mappings of terms and concepts between languages; (ii) be reasonably sceptical of 'equivalent' terms, wherever you find them; and (iii) ensure you have enough specialist knowledge for the task in hand, something that requires ongoing self-evaluation and critical reflection on your professional practice.